CLAIMS

What is claimed is:

1. A system of integrated modules, comprising:

one or more application modules adapted to receive inputs and/or generate outputs, said inputs and said outputs including uncertainty distribution information; and

at least one interface module adapted to communicate with one or more application modules, said interface module adapted to translate uncertainty information from any one of said application modules to a predetermined uniform format and/or to translate uncertainty information from said predetermined uniform format to an application-specific format.

2. The system according to claim 1, wherein said uncertainty distribution information is indicative of a type of distribution and includes data indicative of uncertainty densities.

3. The system according to claim 1, wherein said uniform format is an extensible markup language (XML) format.

4. The system according to claim 3, wherein said XML format includes an uncertainty description element and one or more data elements, said data elements being determined according to said description element.

5. The system according to claim 4, wherein a value of said description element may be one of the set consisting of normal probability density function, exponential probability density function, polynomial chaos expansion, list of points, and histogram.

6. The system according to claim 1, wherein each of said application modules is associated with an input interface module and an output interface module;

wherein said input interface module is adapted to communicate with an output interface module of another application module; and

wherein said output interface module is adapted to communicate with an input interface module of another application module.

7. The system according to claim 1, further comprising:

a platform module adapted to control communication with said application modules through at least one interface module, said platform module being adapted to control data flow between said application modules.

8. The system according to claim 7, wherein said platform module includes a graphic user interface module for displaying information to a user and receiving inputs from a user.

9. The system according to claim 7, wherein said platform module includes an optimization module adapted to optimize a system uncertainty in response to said application modules.

10. The system according to claim 9, wherein said optimization module is adapted to iterate to a convergence of a mean value.

11. A system of integrated modules, comprising:

application means for receiving inputs and/or generating outputs, said inputs and said outputs including uncertainty distribution information; and

interface means for communicating with said application means, said interface means adapted to translate uncertainty information to a predetermined uniform format and/or to translate uncertainty information from said predetermined uniform format to an application-specific format.

12. The system according to claim 11, wherein said uncertainty distribution information is indicative of a type of distribution and includes data indicative of uncertainty densities.

13. The system according to claim 11, wherein said uniform format is an extensible markup language (XML) format.

14. The system according to claim 13, wherein said XML format includes an uncertainty description element and one or more data elements, said data elements being determined according to said description element.

15. The system according to claim 14, wherein a value of said description element may be one of the set consisting of normal probability density function, exponential probability density function, polynomial chaos expansion, list of points, and histogram.

16. The system according to claim 11, wherein said application means is associated with an input interface means and an output interface means;

wherein said input interface means is adapted to communicate with an output interface means of another application means; and

wherein said output interface means is adapted to communicate with an input interface means of another application means.

17. The system according to claim 11, further comprising:

platform means for controlling communication with said application means through said interface means, said platform means being adapted to control data flow to and from said application means.

18. The system according to claim 17, wherein said platform means includes a graphic user interface means for displaying information to a user and receiving inputs from a user.

19. The system according to claim 17, wherein said platform means includes an optimization means for optimizing a system uncertainty in response to said application means.

20. The system according to claim 19, wherein said optimization means is adapted to iterate to a convergence of a mean value.

21. A method for exchanging data, comprising:

receiving an output from an application module, said output including a set of values for an output parameter, said set of values being indicative of a variance in the output parameter;

selecting a distribution type from a predetermined list of types, said selecting being based on a distribution of said set of values; and

determining values of one or more characteristic parameters, said characteristic parameters being associated with said selected distribution type.

22. The method according to claim 21, further comprising:

generating an output set, said output set including said selected distribution type and said values of said characteristic parameters.

23. The method according to claim 22, wherein said output set is in an XML format.